

# Supplier Quality Manual

Release date: 2010-05-31

**Table of contents**

<b>1. Corporate profile .....</b>	<b>3</b>
<b>2. Nova Bus contacts &amp; requirements.....</b>	<b>3</b>
<b>2.1 Business contacts .....</b>	<b>4</b>
<b>2.2 Quality requirements .....</b>	<b>4</b>
<b>2.3 Logistics requirements .....</b>	<b>5</b>
<b>3. Supplier selection process .....</b>	<b>7</b>
<b>3.1 Supplier selection and approval .....</b>	<b>7</b>
<b>3.2 Approval types .....</b>	<b>7</b>
<b>4. Audits and supplier visits.....</b>	<b>8</b>
<b>4.1 SEM .....</b>	<b>9</b>
<b>4.2 General audits (quality / logistics).....</b>	<b>10</b>
<b>4.3 Short Capacity Audits (SCA) .....</b>	<b>12</b>
<b>5. Day-to-day quality and logistics activities.....</b>	<b>13</b>
<b>5.1 Quality &amp; FAI.....</b>	<b>13</b>
<b>5.2 Logistics .....</b>	<b>13</b>
<b>6. Treatment of non-conformities and action plans .....</b>	<b>14</b>
<b>6.1 MCN.....</b>	<b>14</b>
<b>6.2 After-sales support .....</b>	<b>15</b>
<b>7. Supplier performance monitoring process.....</b>	<b>17</b>
<b>7.1 EGF.....</b>	<b>17</b>
<b>8. Derogation / Deviation process.....</b>	<b>18</b>
<b>APPENDICES.....</b>	<b>19</b>
<b>REVISION TABLE.....</b>	<b>20</b>

## 1. Corporate profile

Nova Bus stands as a North American leader in the design, production and marketing of urban transit buses.

Nova Bus is committed to building top quality transit buses. Throughout its evolution, Nova Bus has been guided by the needs and requirements of transit authorities, maintenance personnel, drivers and users.

As a result of significant research and customer input, the Nova LFS meets the growing need for a vehicle that is easily accessible to mobility-impaired people and the elderly. More than 3,500 Nova LFS vehicles are in service in Canada and the United States.

Since October 2004, Volvo Bus Corporation is the sole owner of Nova Bus. Being part of a large international conglomerate such as Volvo provides Nova Bus—and more importantly its customers—with the many and varied opportunities that come with partnerships.

## 2. Nova Bus contacts & requirements

Nova Bus has various requirements for its suppliers in terms of both quality and logistics. This section will list these various requirements, give an overview of their content and refer to more detailed information if necessary. This manual does not supersede specific clauses that might be contracted between Nova Bus/Volvo and a supplier.

All requests to become a Nova Bus supplier must go through the purchasing department. The commodity buyer will assess any business opportunities and initiate the supplier approval process with the supplier quality department.

## 2.1 Business contacts

Your primary contact concerning general questions is your assigned commodity buyer. The buyer will also refer any questions to the appropriate quality, engineering or logistics contact if necessary.

## 2.2 Quality requirements

To maintain our mission objective to supply our customers with superior quality product, there are a number of requirements which our suppliers must meet. Our requirements include but are not limited to the following items.

### 2.2.1 Drawing conformity & other requirements

In accepting to produce parts, suppliers agree to all drawing specifications & other requirements related to any specific part. These requirements include, but are not limited to, production methods, specifications, special measurements and engineering instructions.

### 2.2.2 PPM

Nova Bus expects its suppliers to deliver parts that fulfill agreed specifications. The philosophy behind this is to concentrate preventive and proactive quality assurance activities close to the source of responsibility.

In order to measure and monitor the quality of delivered parts, the PPM (parts per million) level is calculated. The PPM value is defined as the ratio of rejected parts to deliveries multiplied by 1,000,000 ( $PPM=1,000,000*\text{rejects}/\text{deliveries}$ ).

Nova Bus has an internal PPM target of 2,000 PPM for its overall supplier base. Suppliers with long-term agreements with Nova Bus are asked to conform to the PPM target defined in their agreements. Specific agreed PPM targets override Nova Bus' current global PPM target.

### **2.2.3 EGF / QPM**

EGF is the Nova Bus supplier global performance evaluation system, and QPM is the quality indicator. We require our suppliers to be compliant with EGF as described in section 7.

### **2.2.4 Field failure requirements - Reliability**

Field failure effects are measured in % of problem occurrence, based on customer complaints.

A Field Failure target may be set for certain specific components. If not, a 'Zero defects' attitude should apply.

### **2.2.5 International quality & environmental certification**

We strongly encourage our suppliers to pursue international quality management system (ISO 9001) and environmental management system (ISO 14001) certifications. In addition we recommend our suppliers comply with ISO/TS 16949 requirements.

### **2.3 Logistics requirements**

In order to maintain efficient productivity, our suppliers must conform to Nova Bus logistics requirements. Our requirements include but are not limited to the following items.

Revision level: NR	Re: Supplier Quality Manual	Page 5 of 20
Document: AQ-DG-77r0		Release date: 2010-05-31

## 2.3.1 Lead times

Nova Bus requires its suppliers to provide lead times based on their manufacturing times. Nova Bus lead times are also expanded to include transportation and processing times and other delays.

## 2.3.2 Packaging & racking

Packaging should be sufficient to protect the integrity of parts. Also, labelling and paperwork should meet Nova Bus requirements indicated on part drawings. Nova Bus part numbers should appear on packaging labels and paperwork, along with the purchase order number.

Racking can be necessary for the transportation of specific parts. Racking is used for transportation and sometimes sub-assembly but never for storage. Therefore, rack rotation should be rapid. Racking can be requested by the supplier or by Nova Bus. Racking is usually, but not mandatorily, designed and owned by Nova Bus.

## 2.3.3 Freight

Nova Bus logistics assigns suppliers specific routing to be followed, according to geographic location and weight and size of the goods. This routing should be followed; otherwise, transportation fees could be challenged. Standard INCOTERMS is FOB supplier unless otherwise specified.

## 2.3.4 EGF, DPM

EGF is the Nova Bus supplier global performance evaluation system, and DPM is the delivery indicator. We require our suppliers to be compliant with EGF as described in section 7.

Revision level: NR	Re: Supplier Quality Manual	Page 6 of 20
Document: AQ-DG-77r0		Release date: 2010-05-31

### 3. Supplier selection process

This process is owned and directed by the purchasing department. It is a thorough, documented process and part of our ISO 9001 certification. Throughout the process, Nova Bus will ask a number of questions concerning a potential supplier to assist in decision-making. Specific questions concerning this process should be addressed to the buyer responsible for your account.

#### 3.1 Supplier selection and approval

Supplier selection and approval is a purchasing process in which the quality department is involved. Potential suppliers are evaluated by both purchasing and quality based on multiple criteria. Depending on the situation, suppliers can be approved as development suppliers or production suppliers.

The quality department's mission is to ensure that potential suppliers are evaluated correctly and that sourcing decisions are made with total acquisition cost in mind. We assess suppliers with ISO 9001 certification favourably. Our preferred partners should aim for ISO TS/16949 certification.

The Volvo group also requires suppliers to aim for ISO 14001 certification as part of their business plan.

#### 3.2 Approval types

There are two different types of approval in the supplier selection process. Each decision is made on a case-by-case basis.

Revision level: NR	Re: Supplier Quality Manual	Page 7 of 20
Document: AQ-DG-77r0		Release date: 2010-05-31

### **3.2.1 Development suppliers**

This is otherwise known as a temporary approval. This type of approval is for suppliers used in the development process or for prototype single-use parts. This temporary approval can also be used to set up development plans with suppliers that must improve current logistics and quality levels in order to become full production suppliers.

### **3.2.2 Production suppliers**

Once suppliers are completely approved by both purchasing and quality, they can be assigned as production suppliers. Internally, this means that our MRP system recognizes them as approved suppliers and does not block their use for MRP orders. The criteria evaluated for this supplier type include, but not limited to:

- SEM or Short-SEM score
- Part complexity and criticality
- Part quantity and volume
- Part lead time
- Part value

## **4. Audits and supplier visits**

Nova Bus may perform different kinds of audits for its potential and current active suppliers in order to evaluate their processes, system and confidence to deliver our required commodity. These activities are performed to ensure they have sufficient capability to meet Nova Bus quality and delivery targets, and used as a base for supplier development activities and the establishment of long-term relationships with suppliers.

Note: After every audit, suppliers receive a formal audit report from Nova Bus, which specifies audit results and required actions.

Revision level: NR	Re: Supplier Quality Manual	Page 8 of 20
Document: AQ-DG-77r0		Release date: 2010-05-31

The audits we normally perform are listed below.

## 4.1 SEM

SEM stands for Supplier Evaluation Model, which provides a complete assessment of current or potential suppliers and is part of the Global Sourcing Process. Results of SEM audits are uploaded to the Volvo Supplier Information Base (VSIB) by the lead auditor and are available to Volvo group procurement teams worldwide.

There are two types of SEM: Normal and Short models. Normal SEM are used prior to the final selection of potential/new suppliers, while Short SEM are used to evaluate existing suppliers, or as an initial information-gathering tool for potential suppliers.

### 4.1.1 Short SEM

Short SEM are “desk audits” and can be used for quick and easy checks of existing or potential suppliers. The purpose of the short version of Supplier Evaluation Model is to get a quick and easy indication of existing or potential supplier standards. The evaluation is performed as a “desk audit”, so it is essential that sufficient information be provided for each individual question and that all completed appendices (herein) are enclosed to ensure maximum evaluation scoring.

Short SEM are generally not performed on sub-suppliers.

### 4.1.2 Full SEM

Full SEM are onsite audits performed at 1st tier suppliers. 1st tier suppliers are those responsible for doing business with Volvo (the supplier number where orders will be/are placed). In some cases, various sites or suppliers must be evaluated in order to get the full picture, e.g. sales companies with production facilities elsewhere.

Revision level: NR	Re: Supplier Quality Manual	Page 9 of 20
Document: AQ-DG-77r0		Release date: 2010-05-31

Prior to performing Full SEM, lead auditors will request more information from suppliers; audits are held based on the agenda sent to suppliers, and audit results and necessary actions are presented by the end of the audit.

## **4.2 General audits (quality / logistics)**

General audits may be performed any time that Nova Bus wants to have more information about suppliers' situations and processes. They are normally performed as a result of poor quality or logistics performance and are mostly focused on a detailed process which influenced occurrences. These audits will help the supplier identify the main causes, check their action plan, assess their progress or have a general view of their status. It can also be used as a general periodic audit in order to identify any improvement opportunities.

Depending on audit results, suppliers will receive a report and action plan request to address noted issues. Action plans are monitored regularly to establish and implement appropriate actions. Another audit is set up to monitor actions and validate their effective implementation if necessary.

### **4.2.1 General quality audits**

Quality audits are performed to review the suppliers' quality systems and focus mostly on shop floor activities. The main areas that are reviewed in these audits include but are not limited to the following items, which are specified in Nova Bus general audit checklist:

Revision level: NR	Re: Supplier Quality Manual	Page 10 of 20
Document: AQ-DG-77r0		Release date: 2010-05-31

<b>Shop Floor</b>	Receiving inspection, storage and delivery
	Production/Assembly line (process work instructions, maintenance)
	Training (operator training)
	Inspection (control of work in process and finished parts)
	Processing of non-conforming parts
	Continuous improvement
<b>Offices</b>	Analysis of non-conforming product/part process and method (cause analysis)
	Quality Management System
	Product/process development, modification management
	Process development, Quality (Control plan)
	Control of sub-suppliers and sourcing
	Wrap-up

**4.2.2 General Logistics Audits**

Logistic audits are performed to review suppliers’ logistics system and focus mostly on their material flow, ERP, MRP and supply chain management. The main topics reviewed in these audits include but are not limited to the following items:

Shop floor visit, production, receiving , storage and delivery processes
Supplier planning process review: <ul style="list-style-type: none"> <li>- Receiving forecasts and orders; action</li> <li>- Master production scheduling</li> <li>- Material requirement planning</li> <li>- Production planning and controls</li> <li>- Delivery monitoring system</li> <li>- Visibility and traceability of customer orders, from receipt of forecasts to parts delivery</li> </ul>

Parts and raw material purchasing processes
Monitoring of sub-suppliers (delivery performance, logistics, etc.)
Lead time process review
Delivery performance monitoring, on-time delivery precision review and actions

**4.3 Short Capacity Audits (SCA)**

Short Capacity Audits (SCA) are a Volvo tool, normally used before the start of production. Their purpose is to give a snapshot of the supplier’s ability to deliver the required parts at the required volumes at the right time, and especially:

- To determine the maximum possible volume under current conditions
- To determine in what quantities it is possible to increase volume from an existing supplier (for example in order to prepare re-sourcing from a new supplier)
- In case of difficulties, to state what capacity constraints have to be removed in order to avoid delays in delivery.

SCA is *requested* in the following cases:

- New suppliers
- Re-sourcing, supplier change process
- Parts delivered to more than one brand

SCA is *recommended* in the following cases:

- Volume / market increases
- Critical and key components
- New product or project that concerns more than one of our plants
- Spend evolution > +15% per product family and/or process at supplier’s

Note: Production Test Runs (PTR) may be necessary in the above-mentioned cases when there are ongoing supplier delivery issues.

## 5. Day-to-day quality and logistics activities

The section below explains most daily interactions between Nova Bus and its suppliers.

### 5.1 Quality & FAI

All day-to-day supplier quality activities, including in-process problems, are communicated by Nova Bus quality technicians via the Material Complaint Notice (MCN) form ([Appendix C](#)). Suppliers are requested to fill out their response (root cause analysis and action) on the same form and return it to the sender.

In case of misunderstanding or if any more information is needed, suppliers should communicate with their assigned quality technician, who is identified on MCN documents.

**All “first-time” parts for a given supplier and parts that undergo revision are subjected to an FAI (First Article Inspection). Suppliers must include the filled-out FAI form ([Appendix B](#)), physically attached to the part for the first shipment; parts must be visibly identified. FAI forms must also be e-mailed to the Supplier Quality department of the appropriate Nova Bus plant.**

### 5.2 Logistics

All day-to-day logistics issues or concerns are addressed by their assigned planner, including supplier ordering, planning, shipment and logistics issues.

Order planning: Forecasts for MRP parts are sent weekly in accordance to needs. Forecasts are not sent for floor stock. According to supplier lead times, orders are sent by e-mail or fax to the appointed contact. The date indicated on purchase orders is the ship date. Ship dates or quantities may change following changes in design or assembly, defective parts or other.

Revision level: NR	Re: Supplier Quality Manual	Page 13 of 20
Document: AQ-DG-77r0		Release date: 2010-05-31

Transportation: Transportation is scheduled by suppliers as needed. It is suppliers' responsibility to follow shipping instructions, unless otherwise specified by Nova Bus planners.

Shortages: Production shortages are managed by logistics. Any communication regarding short shipments, missing components or other issues that can cause shortages must be forwarded through the logistic planner.

Warranty: In order to avoid and minimize shortages, dispositions regarding MCN are managed by logistics. Defective parts are returned with suppliers' authorization. If replacement is requested, orders are placed, with charge, and credit is taken when the defective parts are returned. Repairs are at suppliers' discretion. In order to avoid shortages, repairs have to be transparent for Nova Bus activities.

Revision: Final drawings are sent by buyers for quotation. When revisions are released, logistics planners send a copy of the new revision along with revised orders if applicable. On the revision form, suppliers are requested to send feedback within 48 hours.

## 6. Treatment of non-conformities and action plans

### 6.1 MCN

For any daily quality issues in production line or receiving quality, production line or receiving monitors issue reject tags to explain and document problems. When problems are supplier-related, supplier quality technicians double-check the rejects and, based on their investigation, issue MCN ([Appendix C](#)).

Revision level: NR	Re: Supplier Quality Manual	Page 14 of 20
Document: AQ-DG-77r0		Release date: 2010-05-31

Quality technicians provide relevant evidence (pictures, packing slips, serial numbers, etc.) to be attached to MCN as needed; quality clerks then prepare and forward them to suppliers for appropriate action.

Suppliers should answer MCN within 2 working days. MCN have a specific area assigned for supplier answers (analysis and action); these should be filled out correctly and completely. Suppliers may also add complementary documents (test reports, pictures, 8D reports, etc.) to their MCN replies.

Quality technicians are responsible for ensuring suppliers answer MCN appropriately and may request more detailed analysis or evidence if necessary.

Please take careful consideration of the “Suggested disposition” section of MCN.

Type of MCN:

Urgent: The situation caused by the non-conformity is urgent and must be resolved very quickly.

Information: MCN are sent to inform suppliers of ongoing minor issues; no parts replacement is required but corrective action must be taken by suppliers.

## 6.2 After-sales support

After-sales issues are handled through a web-based Volvo tool called Quality Report System (QRS).

Nova Bus field service representatives may issue service reports as soon as they encounter problems in the field or our customers claim any problem. After their initial investigation, they classify reports by origin and assign them to the relevant department. In the case of supplier-related issues, they are assigned to the Supplier Quality Assurance (SQA) team in the quality department.

Revision level: NR	Re: Supplier Quality Manual	Page 15 of 20
Document: AQ-DG-77r0		Release date: 2010-05-31

SQA coordinators then transfer service report data to suppliers and ask for root cause analysis, rapid containment action and permanent action plans.

As they are field problems, the goal is to reassure customers as quickly as possible and prevent recurrence. Rapid supplier action is essential to achieve these goals.

Field service representatives provide suppliers with any missing data and sample defective parts if needed.

Service reports are treated in one of the following three ways based on priority, which is determined by SQA coordinators:

1. Priority one – Recurrence and severe issues, safety issues or any issue which has significant influence on Nova Bus production or customers. They require rapid action by suppliers to resolve the issue in Volvo 8D format. Complete data must be communicated at each step of the pre-defined timeframe, to address the issue in detail and as quickly as possible.
2. Priority two – Recurring issues which need rapid and complete action based on the Nova Bus action plan template in order to ensure all the main steps are covered (1-Root cause analysis, 2-Actions, 3-Measure of action effectiveness)
3. Priority three – Normal issues which do not qualify for the above-mentioned priority levels. Action requests are sent via e-mail and handled through routine e-mails and supplier action plan templates (if any) or whatever method is more convenient for suppliers.

### 6.3 Requests for formal action plans

There are several instances where Nova Bus may ask for formal action plans, which include but are not limited to the following cases:

Revision level: NR	Re: Supplier Quality Manual	Page 16 of 20
Document: AQ-DG-77r0		Release date: 2010-05-31

- After performing any kind of supplier audit
- In case of any customer claims or after-sales service issues
- In case EGF scores reach “action” status
- In case of repetitive or severe day-to-day quality or logistics issues
- After any major modification or change in process, product or volume (like changes in plant, supplier, design, or production rate, the addition of new shifts, etc.) which may affect Nova Bus production.

*Note: There is a preferred action plan template which can be provided to suppliers ([Appendix D](#)). Use of the template is not mandatory and may be replaced by suppliers’ format, unless specified by the person requesting the action.*

## **7. Supplier performance monitoring process**

Nova Bus believes that collaboration between customers and suppliers is key to the development of our mutual businesses. As such, we closely monitor our supplier base to target opportunities for improvement.

### **7.1 EGF**

Nova Bus uses a system called EGF to monitor the performance of its supplier base. EGF is a French acronym that stands for “*Évaluation Globale Fournisseur*”, or “Global Supplier Evaluation”. This monitoring system is compiled monthly by our internal MRP system.

The purpose of having a performance monitoring system is to prioritize actions within our supplier base, to work with our suppliers to obtain a higher level of quality and delivery, and lastly, to have a standardized monitoring system to eliminate subjective factors in supplier evaluation.

EGF is calculated on a 3-month rolling average of a number of quality and delivery factors for which details can be found in [appendix A](#). Quality is referred to as QPM (Quality Performance Measure) and DPM (Delivery Performance Measure).

Revision level: NR	Re: Supplier Quality Manual	Page 17 of 20
Document: AQ-DG-77r0		Release date: 2010-05-31

Key suppliers are issued a monthly supplier scorecard. Any supplier may ask their assigned quality contact to be issued a scorecard.

**8. Derogation / Deviation process**

In case of a temporary inability to comply with any Nova Bus technical requirement, suppliers are authorized to submit a deviation request. This request should be made by e-mail through logistics using the waiver request form ([appendix E](#)). The deviation request must be sent to the logistics planner of the affected plant, and separate requests must be made for both plants if necessary. All sections must be filled. The logistics planner will return a signed copy of the deviation request, and only then is shipment authorized. A copy of the signed deviation should be shipped with the concerned parts.

In case a major change needs to be applied, the same process must be followed and the buyer should be advised.

## APPENDICES

NOTE: All appendices can be found on the web site of Nova Bus, in the supplier section.

Revision level: NR	Re: Supplier Quality Manual	Page 19 of 20
Document: AQ-DG-77r0		Release date: 2010-05-31

## REVISION TABLE

REV	DATE	CHANGE	PREPARED BY
NR	May 31st, 2010	NEW RELEASE	